

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
29 December 2004 (29.12.2004)

PCT

(10) International Publication Number  
**WO 2004/113520 A2**

(51) International Patent Classification<sup>7</sup>: C12N 9/50,  
C07K 14/81

MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,  
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,  
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,  
ZW.

(21) International Application Number:  
PCT/EP2004/006805

(22) International Filing Date: 18 June 2004 (18.06.2004)

(25) Filing Language: English

(26) Publication Language: English

(84) Designated States (unless otherwise indicated, for every  
kind of regional protection available): ARIPO (BW, GH,  
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,  
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,  
FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI,  
SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
GW, ML, MR, NE, SN, TD, TG).

(30) Priority Data:  
03394056.0 20 June 2003 (20.06.2003) EP

## Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted  
a patent (Rule 4.17(ii)) for the following designations AE,  
AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ,  
CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE,  
EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS,  
JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA,  
MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM,  
PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ,  
TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM,  
ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, NA,  
SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ,  
BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE,  
BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE,  
IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent  
(BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE,  
SN, TD, TG)

— of inventorship (Rule 4.17(iv)) for US only

## Published:

— without international search report and to be republished  
upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.

(71) Applicants (for all designated States except US):  
NESTEC S.A. [CH/CH]; Avenue Nestlé 55, CH-1800  
Vevey (CH). CORNELL RESEARCH FOUNDATION,  
INC. [US/US]; Suite 105, 20 Thornwood Drive, Ithaca,  
NY 14850 (US).

(72) Inventors (for US only): MCCARTHY, James; 298,  
vallée de Vautruchot, F-37210 Noizay (FR). BEN AMOR,  
Mohamed; 4, rue Frédérique Sauvage, F-37000 Tours  
(FR). PETIARD, Vincent; 18 Allée Côte Fleurie, F-37100  
Tours (FR). TANKSLEY, Steve; 17 Bridle Lane, Dryden  
NY 13053 (US). LIN, Chenwei; Warrenwood Apartments,  
600 Warren Road, #4-3A, Ithaca, NY 14850 (US).

(74) Agents: O'CONNELL, Maura et al.; F.R. Kelly & Co.,  
27 Clyde Road, Ballsbridge, Dublin 4 (IE).

(81) Designated States (unless otherwise indicated, for every  
kind of national protection available): AE, AG, AL, AM,  
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,  
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,

(54) Title: MODULATION OF COFFEE FLAVOUR PRECURSOR LEVELS IN GREEN COFFEE GRAINS

(57) Abstract: The present invention relates to isolated polynucleotides encoding cysteine proteinases; cysteine proteinase inhibitors; and aspartic endoproteinases. The invention also relates to a transformed host cell, preferably a plant cell, in which over- or under- expression of these polynucleotides result in altered levels of coffee flavour precursor levels, specifically, amino group-containing molecules such as amino acids, peptides and proteins, in green coffee grains.